Chapter 4 Cumulative Impacts

4.1 Overview

NEPA defines cumulative impact as "the impact...which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." CEQA defines cumulative impacts as "two or more individual effects which, when considered together are considerable," and suggests that cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (State CEQA Guidelines Section 15355). NEPA includes cumulative impacts within the scope of impacts to be considered in an environmental document.

CEQA documents are required to include a discussion of cumulative effects when those effects are significant, and the State CEQA Guidelines suggest two possible methods for assessing potential cumulative effects (State CEQA Guidelines Section 15130). The first method is a list based approach, which considers a list of past, present, and reasonably foreseeable future projects producing related or cumulative impacts. The second method is projections based, and uses a summary of projections contained in an adopted general plan or related planning document that is designed to evaluate regional or areawide conditions.

While the use of regional projections is one possible method of analyzing cumulative effects under CEQA, it is the required method under NEPA. FHWA guidelines require that regional growth projections from the metropolitan planning organization (Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) in this case) be used as input for the assumed future year conditions.

The Sonoma County Model was used to develop the travel forecasts for development and growth through the year 2030 in the region. The Sonoma County Model estimates future traffic and transit travel demand for the entire county based on projected land use from the 2020 General Plan (current General Plan Update) prepared by Sonoma County and adjusted to 2030 using *Projections 2002* data from ABAG. The 2030 model forecasts include the other planned Highway 101 improvement projects, as described in Section 1.3.3, Related Projects.

The Sonoma County Model and regional projections are used to evaluate impacts on the regional level, as discussed in Section 4.2, Regional Context. A list-based approach is used to address issues "on the ground" that relate to the proposed project footprint and related projects. These issues are discussed in Section 4.3, Local Context.

4.2 Regional Context

Because this document is based on accepted, regional land use forecasts for 2030, and assumes transportation improvements programmed within the same time frame, effects evaluated with the project include the cumulative effects of development within the region. Thus, additional analysis of cumulative effects related to specific development and transportation improvement projects within the region is not necessary for impacts such as land use, transportation, air quality, and noise.

4.3 Local Context

Cumulative effects are not always regional in scope, and the current project was analyzed to determine whether less than significant environmental effects that would be experienced locally could become significant when considered in combination with other reasonably foreseeable future projects in the project area. Reasonably foreseeable future projects are here defined as the projects assumed in the 2030 No-Build Alternative described in Chapter 1 and the other related projects described in Section 1.3.3, Related Projects.

The search for cumulative impacts for this environmental document was also extended to other types of local development projects that might contribute to cumulative loss of resources in the general project corridor. Various sources were reviewed to identify local development projects in the project vicinity, as described below:

- City of Cotati, *Final Addendum to the South Sonoma Business Park EIR*, December 2003;
- City of Santa Rosa Community Development Department, *Summary of Pending Developments,* February 2005;
- City of Rohnert Park Planning Department website; (http://www.ci.rohnert-park.ca.us/cityhall/specificplans.cfm);
- Sonoma County Permit and Resource Managemeent Department website; (http://www.sonoma-county.org/prmd/docs/eir/CanonManorDEIR/index.htm);
- Sonoma County Public Works Department, January 2005;
- Town of Windsor's Planning and Housing Department website; (http://www.ci.windsor.ca.us/210-ShilohRoadVisionPlanMainFile.html); and
- Town of Windsor Planning Department, May 2004.

The additional local development projects identified and included in the cumulative impact analysis are identified in Table 4.3-1. Cumulative impacts considered for these local projects, the projects included in the No-Build Alternative and the related projects identified in Section 1.3.3, Related Projects, include impacts to biological resources, farmlands, aesthetics, and construction traffic. These are discussed by category in the following subsections.

Table 4.3-1: Non-Transportation Projects Considered for Cumulative Impacts

Project & Development Type	Location	Shared Impact Issues
South Sonoma Business Park – General commercial and highway commercial. Under construction.	North of Highway 116, west of Redwood Drive, south of Helman Lane and east of Alder Avenue, City of Cotati.	Water quality; CTS. CTS habitat present and mitigated.
University District Specific Plan – Student housing at Sonoma State University. Draft EIR Nov. 1, 1999.	Rohnert Park Expressway, north of Copeland Creek, west of Petaluma Hill Road.	Water quality; CTS habitat but no CTS present because none known east of Highway 101.
Wilfred/Dowdell Village Specific Plan – General commercial. Date of DEIR, June 1, 1999. Construction completed.	Dowdell Avenue, north of Business Park Drive, intersected by Wilfred Avenue.	Water quality; CTS discussed, habitat not present.
Costco – General commercial. Construction completed.	Redwood Drive, north of Rohnert Park Expressway and Hinebaugh Creek, south of Business Park Drive.	Air quality; water quality; hydrology; no CTS habitat.
Northwest Specific Plan – Residential, commercial and industrial. Date of Specific Plan, December 2004.	Business Park Drive, west of Dowdell Avenue, east of Langer Avenue, and south of Millbrae Avenue.	Water quality / hydrology, potential effect on riparian habitat, wetlands, CTS.
Canon Manor West Subdivision – Infrastructure improvements. Date of DEIR, June 28, 2004.	West of Petaluma Hill Road, south of East Cotati Avenue and east of Bodway Parkway immediately east and adjacent to Rohnert Park.	Air quality, water quality / hydrology, CTS habitat present and mitigated.
Shiloh Road Village – Residential, and commercial. Date of DEIR, September 2004.	Both sides of Shiloh Road between Highway 101 and Old Redwood Highway.	Air quality; substantial adverse effect on wetlands.

4.3.1 Biological Resources

4.3.1.1 Natural Communities

Section 1.3.3.1, Highway 101 HOV Lane Widening and Improvements Projects, describes the related projects in the Highway 101 corridor. Because all of these projects are similarly adding HOV lanes in the corridor, they would be expected to affect natural communities in roughly similar proportions to this project, as discussed in Section 3.15.1, Natural Communities. The pre-dominant community in the project corridor is ruderal/disturbed vegetation, and this community is not particularly sensitive for habitat values. The sensitive communities affected by these transportation projects—wetlands/waters and riparian—would be fully mitigated in accordance with specific environmental laws for the protection of such resources. Consequently, no substantial cumulative impacts are anticipated from all these corridor transportation projects.

Impacts to natural communities were also considered for the local development projects previously listed. Impacts identified (without quantification) would be fully mitigated in accordance with specific environmental laws for the protection of resources.

4.3.1.2 Wetlands

Table 4.3-2 summarizes the cumulative permanent losses from the following projects for which wetlands impacts have been defined:

Table 4.3-2: Cumulative Impacts to Wetlands and Other Waters of the U.S. (hectares/acres)

Project	Total Area of Impact	Cumulative Impact (After Mitigation Provided)
Highway 101 HOV Lane Widening Project – Steele Lane to Windsor River Road	0.02 ha (0.06 ac)	Impacts would be fully mitigated in accordance with environmental laws and regulations, so no cumulative impact would result.
Route 101 HOV Widening – Route 12 to Steele Lane	0.04 ha (0.10 ac)	
Highway 101 – Wilfred to Route 12 Widening and Soundwall Construction	0.17 ha (0.42 ac)	
Highway 101 HOV Lane Widening Project – Old Redwood Highway to Rohnert Park Expressway	0.20 ha (0.48 ac)	
Canon Manor West Subdivision	0.00 ha (0.00 ac)	
South Sonoma Business Park	1.42 ha (3.50 ac)	
Costco, Redwood Drive	0.00 ha (0.00 ac)	
Wilfred / Dowdell Village Specific Plan	0.10 ha (0.25 ac)	
Northwest Specific Plan	Not yet determined	
University District Specific Plan	Not yet determined	
Shiloh Road Village Plan	Not yet determined	
Total (of projects with determined potential impacts to wetlands)	1.95 ha (4.83 ac)	

Because the total impacts are relatively low and the impacts will largely be mitigated to ensure no net loss of wetlands and other waters, the proposed project does not contribute substantially to a cumulative impact with these other projects.

4.3.1.3 Special-Status Wildlife Species

Pacific Salmon and Trout: Coho Salmon, Steelhead, and Chinook Salmon

The proposed project would permanently affect up to 0.0039 ha (0.0097 ac) of aquatic habitat at Mark West Creek that provides suitable habitat for coho salmon, steelhead, and California Coast chinook salmon. The Central California coho salmon is federally and state listed as endangered; the other two fish species are federally listed as threatened.

There are three related projects for which there is information on impacts to coho salmon, steelhead, and chinook salmon. The Highway 101: SR 12 to Steele Lane project would have no impact on coho salmon, steelhead, and chinook salmon. The Highway 101: Wilfred Avenue to State Route 12 project (already constructed) proposed to relocate any stranded salmonids during dewatering associated with replacement of bridge spans over Santa Rosa Creek, and was designed to have positive long-term effects on salmonid habitat. The Highway 101 HOV Lane Widening Project: Old Redwood Highway to Rohnert Park Expressway would have no impact on coho salmon, steelhead, and chinook salmon. Avoidance, minimization, and/or mitigation measures described in Subsection 3.15.3.3,

Environmental Consequences, which will be established through formal consultation with the NOAA Fisheries, would be sufficient to avoid cumulative impact to coho salmon, steelhead, and chinook salmon for these projects.

The other projects listed in Table 4.3-2 identified no impacts to Pacific salmon and trout aquatic habitat.

Russian River Tule Perch

The same 0.0039 ha (0.0097 ac) of affected aquatic salmonid habitat at Mark West Creek also provides suitable habitat for Russian tule perch, a federal and state species of special concern. Mitigation measures as described above for impacts to coho salmon, steelhead, and chinook salmon would avoid cumulative impact to Russian River tule perch.

The other projects listed in Table 4.3-2 reported no impacts to Russian River tule perch habitat.

California Tiger Salamander (CTS)

The present project and four other projects in the general project vicinity appear to affect areas with potential to contain California Tiger Salamander (CTS). Consultation with the USFWS and CDFG is ongoing to determine impacts and compensation measures for each project. Results and cumulative impacts for the Highway 101 HOV Lane Widening Project−Steele Lane to Windsor River Road and cumulative impacts with these other projects will be reported in the Final Environmental Document.

Table 4.3-3: Status of Determination of Impacts to CTS Habitat

Project	Permanent Impacts	Temporary Impacts
Highway 101 HOV Lane Widening Project – Steele Lane to Windsor River Road	6.36 ha (15.72 ac)	0.00 ha (0.00 ac)
Route 101 HOV Widening – Route 12 to Steele Lane	0.00 ha (0.00 ac)	0.00 ha (0.00 ac)
Highway 101 – Wilfred to Route 12 Widening and Soundwall Construction	1.74 ha (4.31 ac)	0.00 ha (0.00 ac)
Highway 101 HOV Lane Widening Project – Old Redwood Highway to Rohnert Park Expressway	12.19 ha (30.14 ac)	0.00 ha (0.00 ac)
Canon Manor West Subdivision	0.00 ha (0.00 ac)	0.00 ha (0.00 ac)
South Sonoma Business Park	13.81 ha (34.13 ac)	0.00 ha (0.00 ac)

Federal highway projects and other actions are generally subject to federal and state laws and permit processes requiring consideration of and mitigation for impacts to special-status species and their habitats; to wetlands/waters; and to water quality. These laws and requirements ensure that the impacts of such undertakings will be fully mitigated. Impacts to CTS are covered under these laws and requirements, since the species not only has federal protection by virtue of its listing status, but also its breeding habitat consists of ponded areas of sufficient duration and quality for these areas to be protected as special aquatic sites. Minimization and mitigation measures required for these projects would ensure that they have no contribution to cumulative impacts. For example, the South Sonoma Business Park will fully mitigate for the loss of CTS habitat by providing replacement habitat on an acre for acre basis within the Santa Rosa Plain. The Canon Manor project incorporated BMPs although it did not identify any permanent effects.

Northern Red-legged Frog, Foothill Yellow-legged Frog, Western and Northwestern Pond Turtle

The same 0.0039 ha (0.0097 ac) of affected aquatic habitat at Mark West Creek that provides suitable habitat for salmonids and Russian River tule perch also provides suitable habitat for northern red-legged frog, foothill yellow-legged frog and western and northwestern pond turtle. Preconstruction surveys for these species, as described in Section 3.15.3, will be conducted at Mark West Creek in connection with the proposed project. If individual northern red-legged frogs, western or northwestern pond turtles are encountered, they would be moved immediately to a relocation site that is a minimum of 100 meters from the construction area boundary. Thus there would be no cumulative impact to northern red-legged frog, foothill yellow-legged frog, and western and northwestern pond turtles.

The seven projects cited above for which there is information on impacts indicated no impacts to habitat suitable for northern red-legged frog or foothill yellow-legged frog and western and northwestern pond turtles.

4.3.1.4 Valley/Coast Live Oaks

The proposed project would remove 77 valley oaks (26 mature) and 25 coast live oaks (11 mature) along the Highway 101 right-of-way within the project limits. These would be replanted at a ratio and location(s) to be determined.

There are three related projects for which there is information on impacts to oak trees. The Highway 101 – Route 12 to Steele Lane project would remove about 80 mature and about 220 small valley/coast live oak trees; the project would replant up to 300 oaks as replacement woodlands in a natural area either along Highway 101 or in the immediate vicinity. The Highway 101 – Wilfred Avenue to Route 12 project removed about 87 valley/coast live oak trees. The Highway 101 HOV Lane Widening Project, Old Redwood Highway to Rohnert Park Expressway, would remove 17 valley oaks along the Highway 101 right-of-way within the project limits. These would be replanted at a ratio and location(s) to be determined. Because of the tree replacements, there would be no cumulative impact on valley/coast live oaks.

The other projects shown in Table 4.3-1 identified no impacts to Valley/Coast Live Oaks.

4.3.2 Farmlands

Table 4.3-4 summarizes the cumulative permanent losses from the following related projects for which farmland impacts have been identified.

The proposed project would require from 1.11 hectares (ha) (2.74 acres [ac]) to 1.30 ha (3.21 ac) of farmland, depending on the option selected at the Fulton Road/Airport Boulevard Interchange Complex. Affected farmland would account for approximately 0.002 percent of the total farmland in the county, depending on the option selected. Farmland under Williamson Act contracts would account for 0.75 ha (1.87 ac) to 0.86 ha (2.12 ac) of the affected farmlands.

Based on Table 4.3-4, the cumulative impacts to farmland from the present and related Highway 101 projects would still be small, representing a total of from 1.55 to 2.74 ha (3.83-4.29 ac), or approximately 0.003 percent of total county farmland.

Table 4.3-4: Cumulative Impacts to Farmlands (hectares/acres)

Project	Total Area of Impact
Route 101 HOV Widening – Route 12 to Steele Lane	0.00 ha (0.00 ac)
Highway 101 – Wilfred to Route 12 Widening and Soundwall Construction	0.00 ha (0.00 ac)
Highway 101 HOV Lane Widening Project – Old Redwood Highway to Rohnert Park Expressway	0.44 ha (1.08 ac)
Highway 101 HOV Lane Widening Project – Steele Lane to Windsor River Road	1.11 ha (2.75 ac) – 1.30 ha (3.21 ac)
Canon Manor West Subdivision	0.00 ha (0.00 ac)
Northwest Specific Plan	0.00 ha (0.00 ac)
University District Specific Plan	0.00 ha (0.00 ac)
Shiloh Road Village Plan	0.00 ha (0.00 ac)
Total	**1.55 ha (3.83 ac) – 2.74 ha (4.29 ac)**

4.3.3 Aesthetics

The primary effect that this project and related Highway 101 projects would have on corridor aesthetics would be the removal of redwood trees along the highway. This project would remove 179 mature redwood trees, or about eight percent of the total within the project limits. The proposed project would replant redwood trees along linear portions of the Highway 101 corridor (where feasible), and near interchanges and points of entry into cities within the project limits. However, the replacement ratio and locations have not been determined.

There are four related projects for which there is information on impacts to redwood trees. The Highway 101 – Route 12 to Steele Lane project would remove about 100 redwoods trees, which make up about one-third of the existing redwoods within its project area; the project would maximize replanting of redwood trees along Highway 101 where they can be placed without impairing sight distances or encroaching into clear recovery areas. The Highway 101 – Wilfred Avenue to Route 12 project removed about 200 redwood trees and will replace them, where feasible, along the straightaway segments of the project, at interchanges in the project area, and along straightaway segments of Highway 101 south of the project area. The Highway 101 HOV Lane Widening Project, Old Redwood Highway to Rohnert Park Expressway, would remove 387 redwood trees out of 3,048 redwood trees within the project limits, or 13 percent of the total. The project would replant redwood trees along Highway 101 (where feasible), but the replacement ratio has not been determined. The Canon Manor West Subdivision, located east and adjacent to the City of Rohnert Park in Sonoma County, would remove up to 15 redwood trees from the project area. The project would replace the removed redwood trees in approximately the same location.

Because the redwood trees would not be located at their original sites, the visual character of the highway would change, but this impact although adverse is not considered to be substantial, individually or cumulatively. The redwood trees affected were originally introduced as landscaping

to enhance the corridor and to reinforce motorists' and residents' perception of Highway 101 as the "Redwood Highway." They did not originate naturally along the Highway 101 corridor. Replacement planting plans would be developed in coordination with Sonoma County and the local cities to be consistent with state and local laws affecting removal of trees. As replacement planting matures over a period of time, there would be a reduction in impacts to corridor aesthetics.

4.3.4 Traffic

If two or more projects in the same transportation corridor are under construction at the same time, there could be excessive traffic delays and detours. As described in Section 2.5, Project Schedule, construction of the proposed project is planned to begin in 2009. As described in Section 1.3.3.1, Highway 101 HOV Lane Widening and Improvements Projects, construction of the related projects would begin in various years, but assuming a construction period of three years for each project, the construction of all of the remaining Highway 101 HOV projects would overlap in 2008 through 2009, with the overlaps tapering on either side of this period.

There would be two possible sources of delays over this 38-mile corridor from Route 37 to Windsor: 1) mainline delays due to construction adjacent to the traveled lanes or temporary closures of the mainline due to work overhead or connecting into the highway and 2) delays to entering/exiting traffic due to temporary ramp closures, with attendant detours. Planned construction traffic management provisions in the Traffic Management Plan for each of the projects would minimize the mainline delays due to construction adjacent to the traveled lanes; this would avoid a substantial cumulative effect. The delays due to temporary mainline or ramp closures would primarily affect the areas within each project limits. Close coordination among the projects on temporary closures would avoid a substantial cumulative impact.

Permanent cumulative effects of Highway 101 widening would be beneficial, as future traffic demand would be better accommodated by increased effective capacity with the HOV lanes.